National Technics

Direct Drive Automatic Turntable System

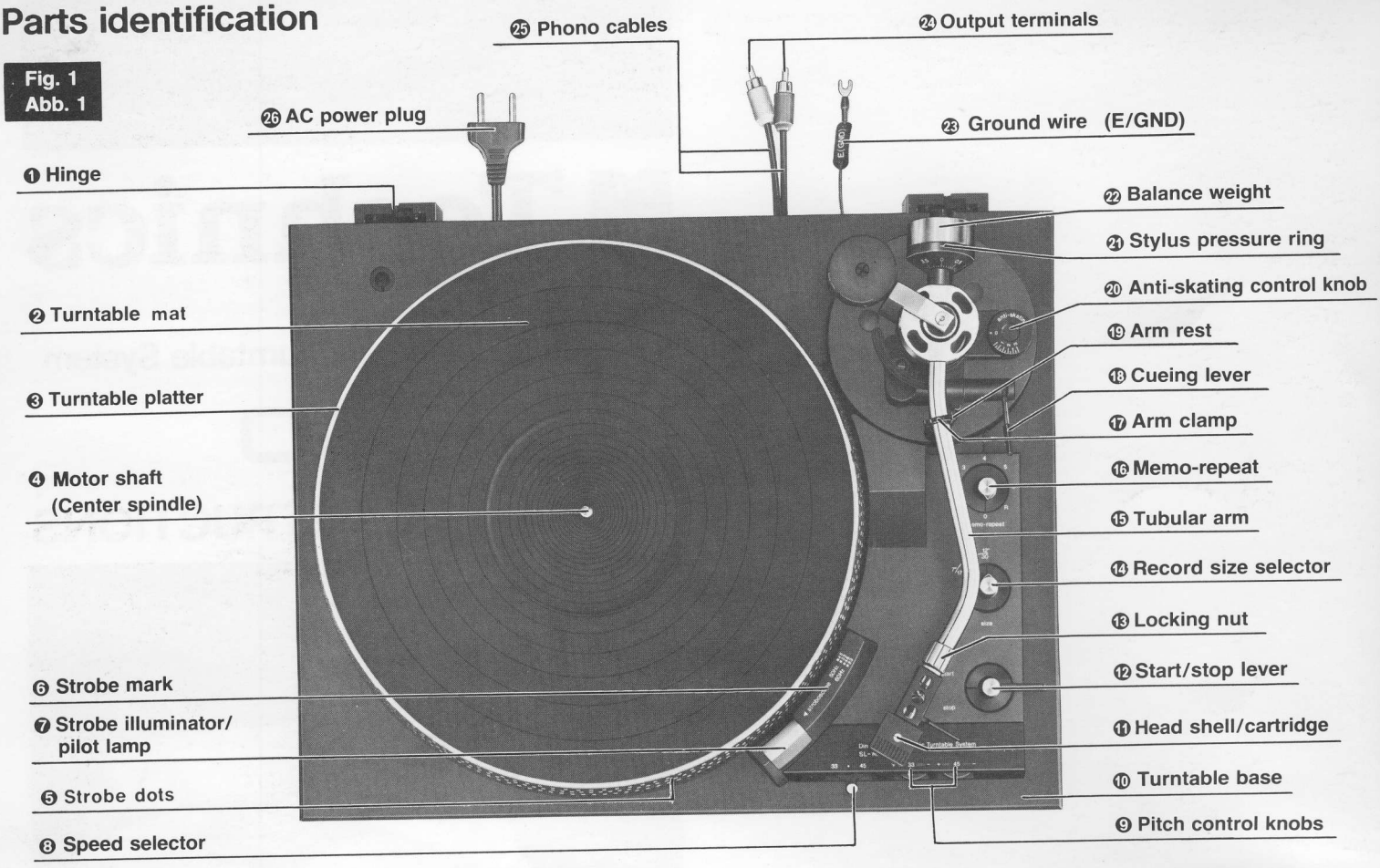
SL-1900

OPERATING INSTRUCTIONS

Before operating this set, please read these instructions completely.

Parts identification

Fig. 1
Abb. 1



We want to thank you for selecting the SL-1900, Direct Drive Automatic Turntable System.
For optimum performance, we recommend that you read these instructions carefully.

Caution: Never connect the AC power plug before the assembly has been completed.

Assembly and set-up

The operating instructions are commonly applicable to sets with cartridge and without cartridge, so that please refer to the following notes for further information.
Since the overhang gauge is furnished to sets without cartridge, refer to the item concerning cartridge installation for correct mounting.
For sets without cartridge, the cartridge section of the specifications may be neglected.

❶Check the parts.

Turntable unit	1	45 r.p.m. adaptor	1
Turntable platter	1	Special oil	1
Turntable mat	1	Balance weight	1
Dust cover	1	Head shell/cartridge	1
		(Overhang gauge	1)

❷Apply two or three drops of oil to the motor shaft using the furnished oil container. (See Fig. 2.)
Although the unit has been lubricated before shipping from the factory, apply a few drops of oil to the motor shaft for assurance. After that, application of two or three drops of oil once every 2000 hours' operation or so is sufficient. The time interval is much longer than that of the former type motors (200–500 hours), so do not apply too much oil, nor more frequently than necessary. Never use any other type of oil.

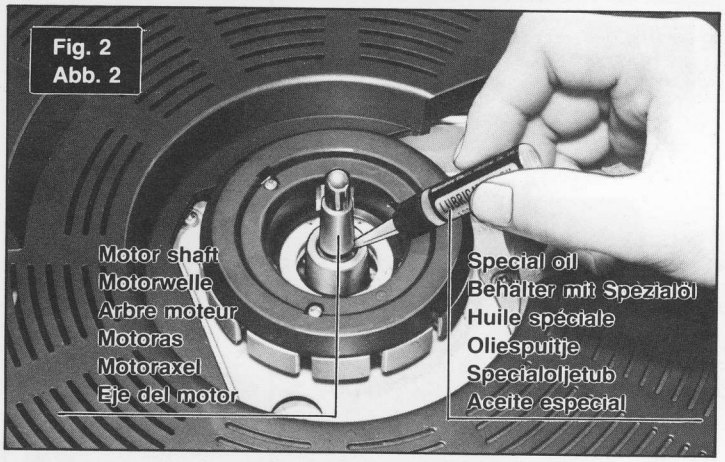
❸Installation of the turntable platter

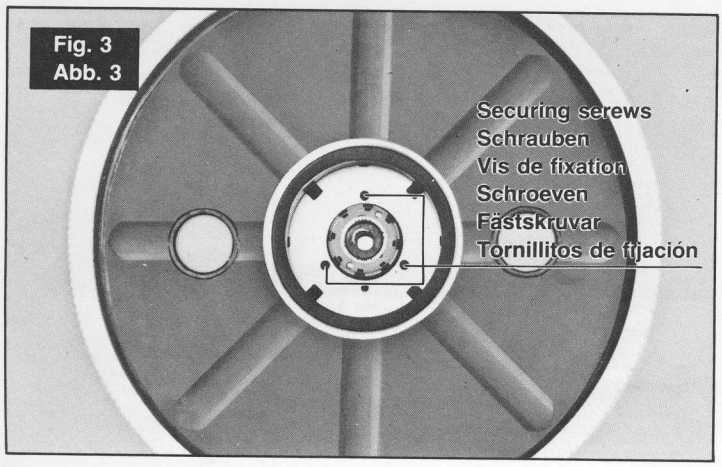
1. Place the turntable platter on the motor shaft (center spindle).
2. Place the turntable mat on the platter.

Note:

1) The rotor is connected to the reverse surface of the turntable platter. (The magnet of the motor is attached to the turntable platter.) To maintain optimum performance as specified, extra care should be taken to prevent adhesion of dust or iron filings to the magnet and not to damage the magnet by dropping it.
2) Do not remove the three screws for securing the magnet. (See Fig. 3.)
Should the position of the fixed magnet be altered by loosening the securing screws, the rated performance of the unit can not be guaranteed.

❹Installation of the head shell (See Fig. 4.)
Insert the plug portion of the head shell into the front end of the tubular arm, and turn the locking nut clockwise (in the direction shown by the arrow "A"), with the head shell held horizontally to secure firmly.





❺Adjustments of the horizontal "0" balance and the stylus pressure

1. Insert the balance weight onto the rear shaft of the tonearm. (See Figs. 5.)
2. Remove the stylus cover, if your cartridge has one.
3. Release the arm clamp (Fig. 6) and lift the tonearm from the arm rest to free the tonearm.

Note:

If the tonearm is urged to return to the arm rest when the tonearm is held in a free state in Fig. 7, rotate the turntable platter clockwise about 10 times. This is necessary because in rare cases the automatic mechanism may have engaged the tonearm gear or moved out of its normal position during transportation.

4. Turn the entire balance weight clockwise (indicated by the arrow "A") or counterclockwise (indicated by the arrow "B") until the tonearm is approximately balanced horizontally. (See Figs. 7 and 8.)
5. After the tonearm is horizontally balanced, temporarily fix the tonearm by the arm clamp. (See Fig. 9.)
   Hold the balance weight stationary with fingers as shown in Fig. 9 and rotate only the stylus pressure ring to bring the numeral "0" of the ring into alignment with the center line on the tonearm rear shaft. (The adjustment of the horizontal balance is now completed.)

Note:

1) During the adjustment of the horizontal balance, be sure that the stylus tip of the cartridge does not contact the turntable mat or turntable base.
2) Ensure that the anti-skating knob is at "0" position. (See Fig. 9.)
   There are cases where the tonearm may sway or flow slightly at the position of "0" due to the highly sensitive rotational part of the tonearm, but this side force is trivial and presents no inconvenience.
3) Ensure that the cueing lever is in the lowered position as shown in Fig. 6.
4) Make certain that the speed selector is in the "•" position, the balance adjustment is easily made as the turntable platter remains stationary.

6. After adjusting the horizontal balance, turn the balance weight clockwise in the direction of the arrow and align the correct stylus pressure (1.75 g). (See Fig. 10.)

Note:

1) As the stylus pressure ring rotates together with the balance weight, proper stylus pressure can be selected by directly reading the graduated ring.
2) In cases where the recording level of a record is extremely high or the unit is used in a room having low temperature or records are played in places where vibrations are liable to be transmitted to the turntable system, "distortion" of sound or "skipping" of stylus may take place. In such cases, set to "2 g" for optimum performance.

❻Anti-skating force control

Set the anti-skating control knob to the same value as that set for stylus pressure. (See Fig. 11.)

❼Installation of the dust cover (See Fig. 12.)

Place the dust cover into position from directly above, holding it at both sides. For detaching the dust cover, be certain first to raise it as illustrated before removal.

Fig. 6
Abb. 6

Arm clamp
Tonarm-Arretierklammer
Dispositif de fixation du bras
Armklem
Låsklämma för tonarm
Grapa del brazo

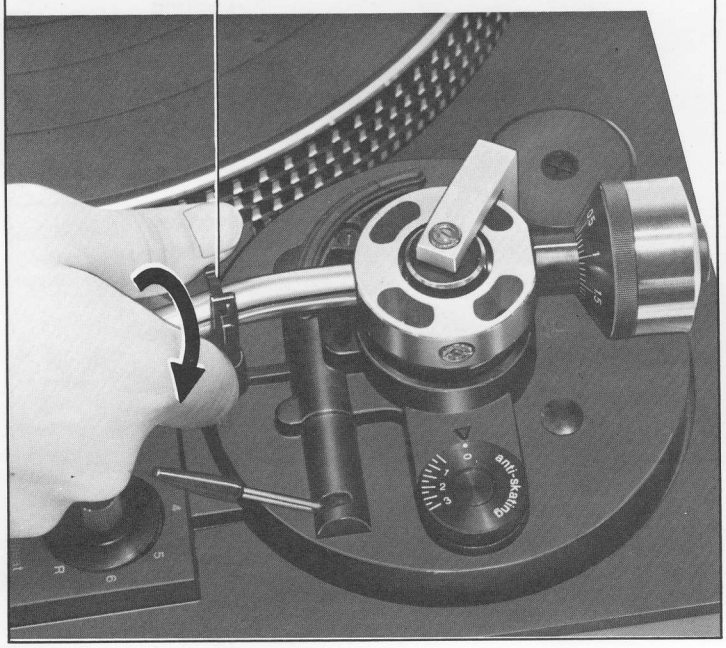


Fig. 7
Abb. 7

Note:
Opening or closing of the dust cover during playing should be made as gently as possible, since this may not only cause harmful turntable vibrations, but also result in skipping of the stylus.

❽Placement

1. Use the unit in a stable and horizontal position, where there is little or no vibration.
2. Use the unit as far away from the speakers as possible and isolate it from sound radiation from them.
3. Do not place the unit where it is exposed to direct sun, dust, moisture or heat.
4. Keep it in a well-ventilated place.

❾Connect the AC power plug.

Connect the AC power plug to the AC socket.
Make sure that the AC line voltage selector is correct to your local voltage before connecting the AC power plug.
Never connect to a DC socket.
If the pre-selected voltage is different from your local voltage, turn the AC line voltage selector with a screwdriver to your local voltage. (See Fig. 13.)

❿ Connect the output terminals.

Output terminals		Amplifier or Receiver
L (White)	→	L Channel
R (Red)	→	R Channel
E (Spade lug)	→	GND

Note:
Be sure to connect the ground terminal to the amplifier or receiver. If this connection is not made or is loose, a power source "HUM" will result.

How to play

Manual play

❶ Set the speed selector to the desired record speed. (See Fig.

❷ Release the arm clamp.

❸ Lift the cueing lever as indicated by the arrow. (See Fig. 15.)

❹ Move the tonearm over the record and then lower the cueing lever. The tonearm will descend slowly onto the record and play will begin.

❺ When finished playing, the tonearm will automatically return to the arm rest (auto-return) with the power shut off, and the turntable platter will stop rotation.
(The turntable platter will rotate for a short time due to its inertia.)

Note:

1) When the tonearm is moved towards the record, the power is turned on and the turntable will start rotating.
If the speed selector is positioned at "•", the turntable wi not rotate, although the strobe illuminator is lit.
2) If you play a 45 r.p.m. record with a large center hole, use the furnished adaptor on the center spindle.

Automatic play

❶Set the speed selector in the same manner as in manual play and release the arm clamp.

❷Set the record size selector to the diameter of the record (7" [17 cm], 10" [25 cm], or 12" [30 cm]) you wish to play. (See Fig. 16.)

Fig. 8
Abb. 8

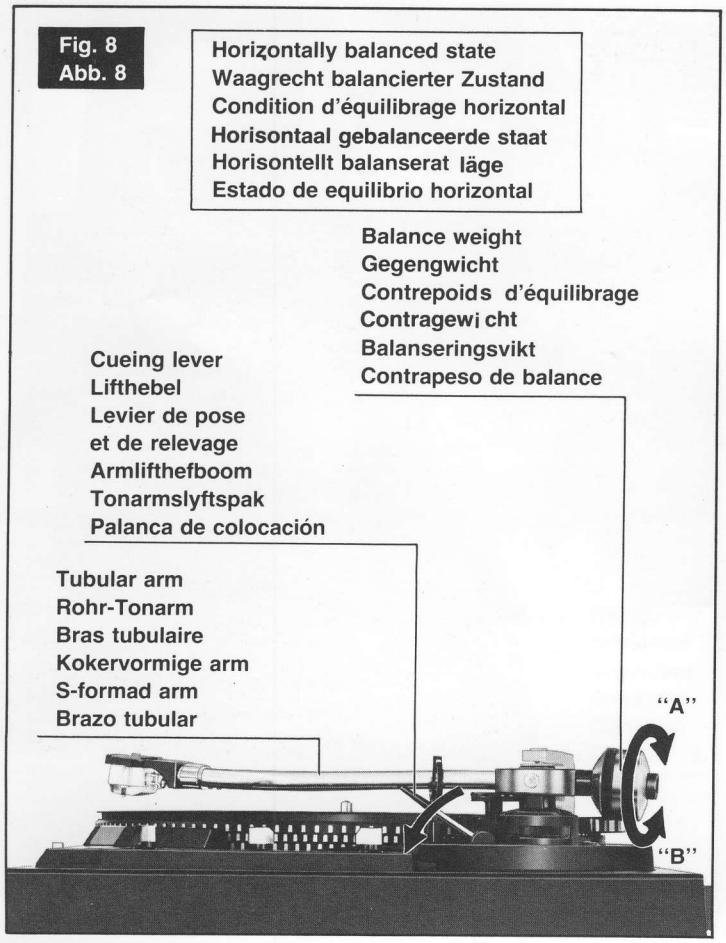
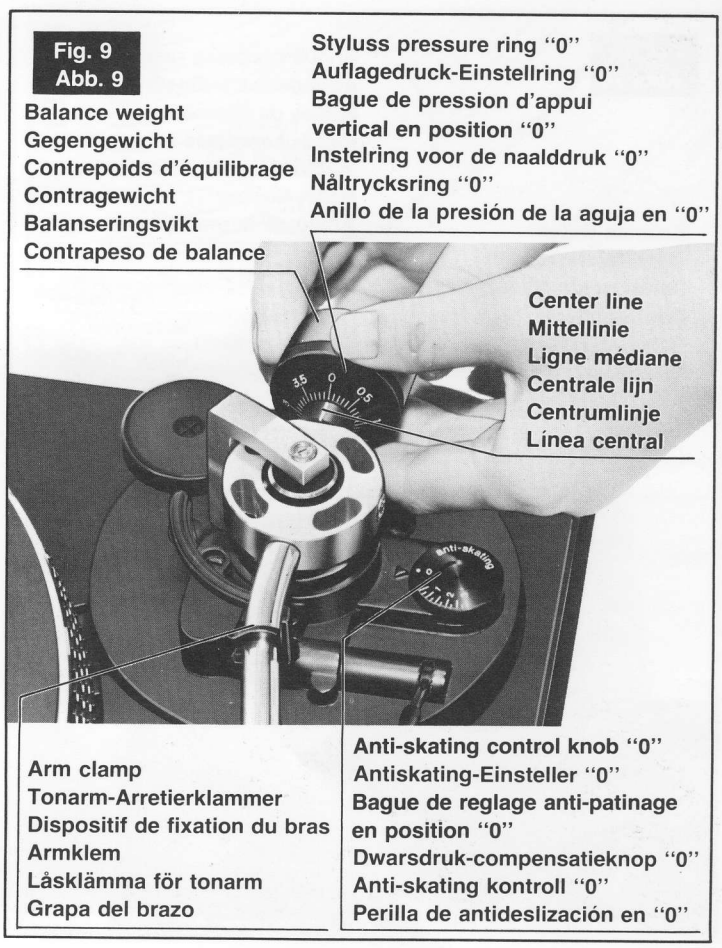


Fig. 9
Abb. 9



❸Pull the start/stop lever.
The tonearm will move according to the size of the record set, and start playing (Automatic start).

❹When playing has finished, the tonearm will return to its rest and the unit will shut off automatically.

Repeat play using the "memo-repeat" knob

This unit is equipped with a convenient mechanism of the "memo-repeat."
You can play the record repeatedly from one to six times or continuously by setting this knob to the desired position.
Set the "memo-repeat" knob to the desired number you wish to play. (See Fig. 17.)
"R" position enables you to repeat playing continuously.
Note:
The "memo-repeat" knob may be turned either clockwise or counterclockwise without any inconveniences, but care should be taken not to touch it when the tonearm is in movements for automatic start, automatic return, etc.

How to suspend playing

Push lhe start/stop lever.
The tonearm will automatically return to the arm rest, with the power source shut off.
Of course, the unit will automatically shut off even when the tonearm is manually returned to its arm rest directly.

For temporary suspension of playing, raise the cueing lever, and the stylus tip of the cartridge will be raised from the record.

Note:
1) In case where the "memo-repeat" knob is located in position other than "0", playing will be repeated by the number of times set, and therefore, be sure to keep the "memo-repeat" knob located at the "0" position.
2) Records having dimensions other than 17, 25 and 30 cm (7", 10" and 12") should be played by "Manual" play.

Fig. 10
Abb. 10

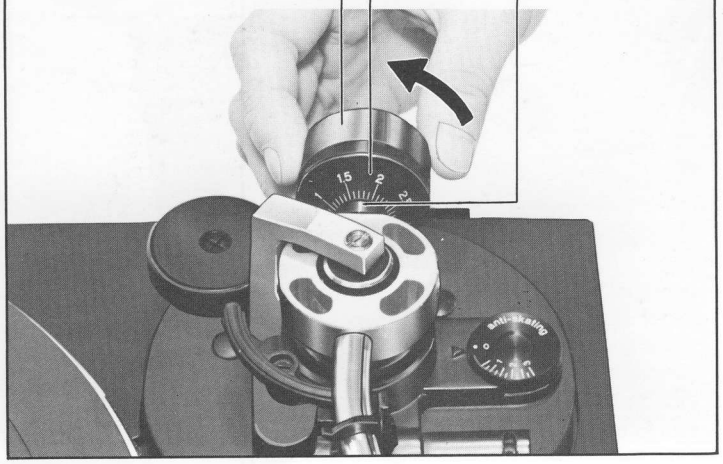
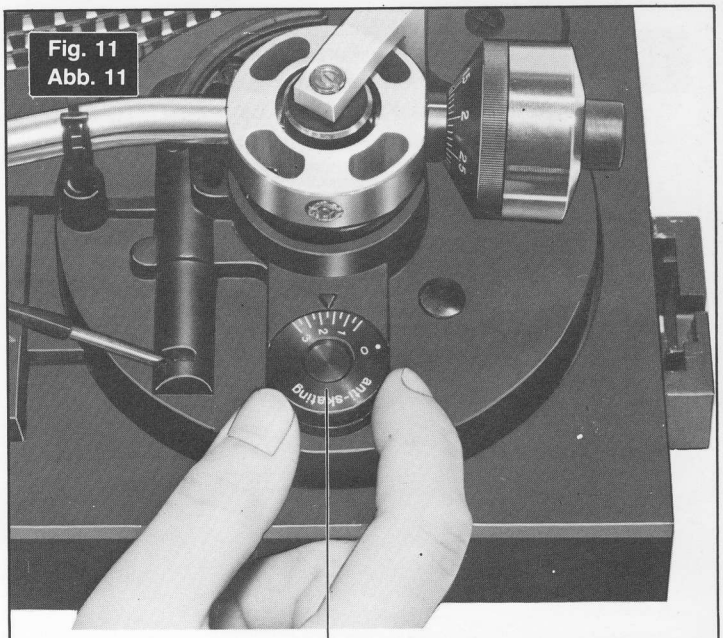


Fig. 11
Abb. 11



Adjustments

❶Adjustment of the arm lift height (See Figs. 18 and 19.)

The arm lift height (distance between the stylus tip and record surface when cueing lever is raised) has been adjusted at the factory before shipping to approximately 5 to 10 mm (3/16" to 25/64").

For using different cartridges available on the market or when further adjustments are particularly necessary, move the tonearm toward the motor shaft (center spindle), with the stylus cover put on, and then push down manually on the arm lift bar to expose the adjustment screw. Turn the screw for adjustment.

Clockwise rotation

—distance between the record and stylus tip is reduced.

Counterclockwise rotation

—distance between the record and stylus tip increases.

Note:

As the adjusting screw has a hexagon head, be sure to make the adjustment while depressing the arm lift.

❷Adjustments for automatic start and automatic return positions (See Fig. 20.)

Should the tonearm not function correctly, make adjustments according to the following procedures.

Adjustment for automatic start position

(Remove the rubber cap.)

In cases where the stylus tip descends outside of the record

— Move clockwise.

In cases where the stylus tip descends onto halfway of a recorded piece

—Move counterclockwise.

Adjustment for automatic return position

(Remove the turntable mat.)

In cases where the tonearm tends to return before the playing has finished

— Move clockwise.

In cases where the tonearm fails to return after the last groove of the record

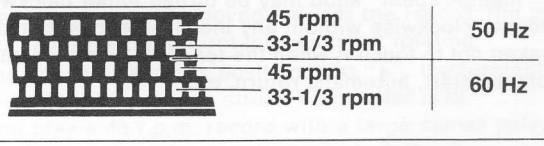
— Move counterclockwise.

❸Speed adjustment (with pitch control knobs)

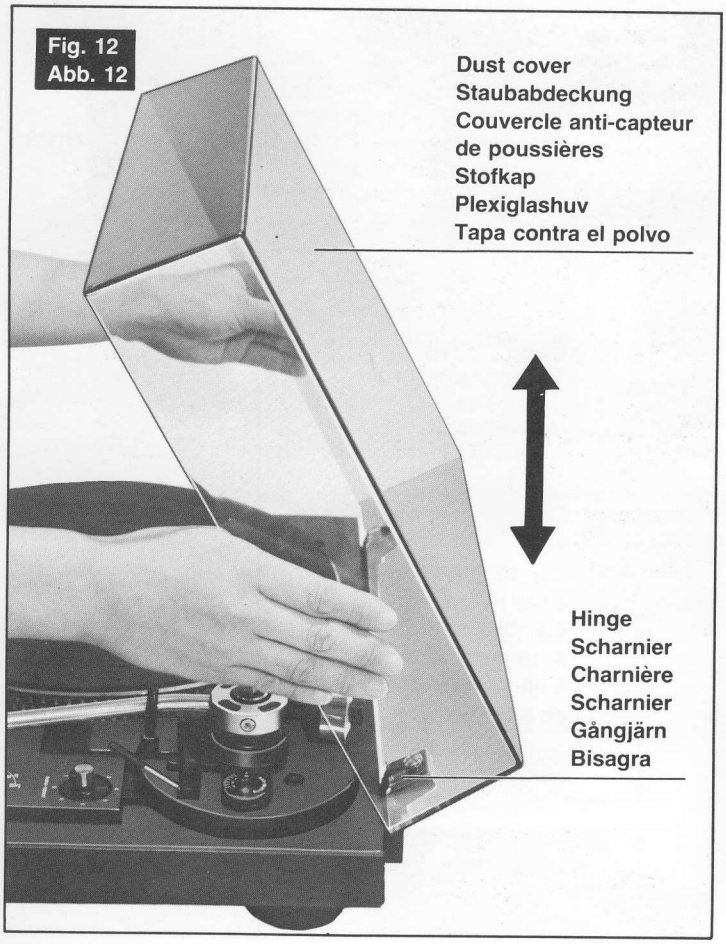
(See Figs. 21 and 22.)

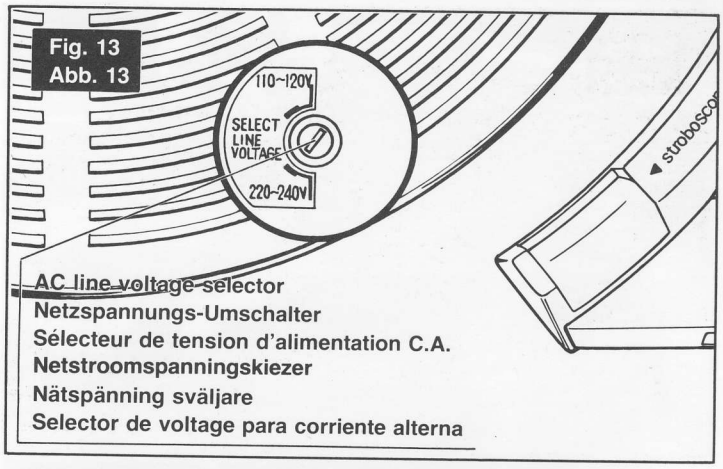
Strobe dots are set on the rim of the turntable platter according to the power frequency and the number of revolutions of the records, Make adjustment, referring to strobe dot indication. (See Fig. 21.)

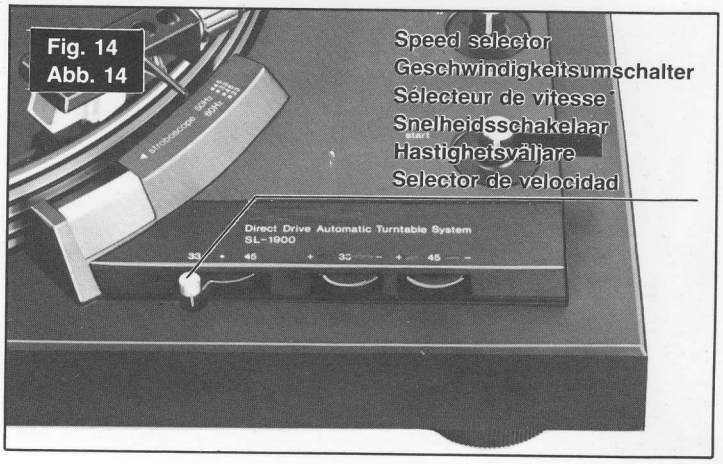
Fig. 21



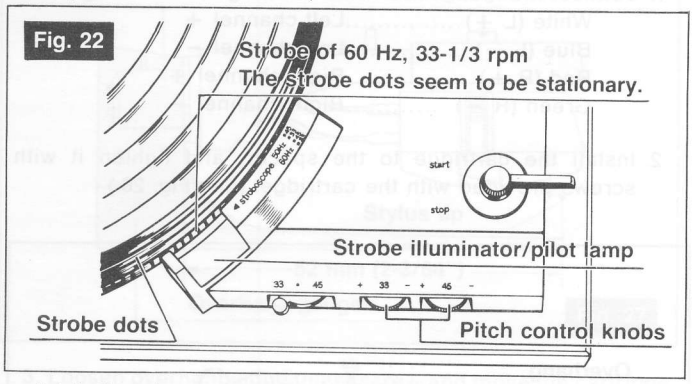
1. Set the speed selector to the number of revolutions to be adjusted. (See Fig. 22.)
2. Release the arm clamp and raise the cueing lever.
3. Move the tonearm to a slight extent towards the turntable platter.
   The strobe illuminator/pilot lamp will be lit for illuminating the strobe dots.
4. While turning the pitch control knobs either to "+" side or "−" side, adjust to such an extent that the strobe dots of the turntable look as if they were stationary.







The state under which the strobe dots seem to be stationary represents the correct speed.



" + " direction

This increases the speed of the turntable rotation, and the strobe dot pattern seems to flow in the same direction as the turntable platter.

" − " direction

This decreases the speed of the turntable rotation, resulting in a state opposite to that in the " + " direction.

Note:

Strobe dot pattern

The strobe illuminator/pilot lamp of this unit employs the commercially available power source. The frequency of such power source, when actually measured, has a fluctuation of about 0.2%. As such a fluctuation of the power source affects the strobe illuminator, the strobe dot pattern also seems to fluctuate to a certain extent. But the unit is not affected by the fluctuations of the power source, since a D.C. motor is employed.

Maintenance

❶Extra care should be taken in handling the turntable platter.

The turntable platter has a rotor (the magnet of the motor) directly connected to it. Therefore, the turntable platter should not be removed from the motor shaft unnecessarily, since adhesion of dust or iron filings onto the magnet results in deterioration of the performance. Should it become necessary to remove the turntable platter, be sure to pull the AC power plug out of the socket.

❷Wipe the dust cover and turntable base with a soft, dry cloth.

Never use any cleaners containing alcohol, benzine or thinner. Use of a chemical dust cloth and the like should also be avoided. Be sure that the dust cover is not exposed to insecticide spray, as cracks or blurs may result.

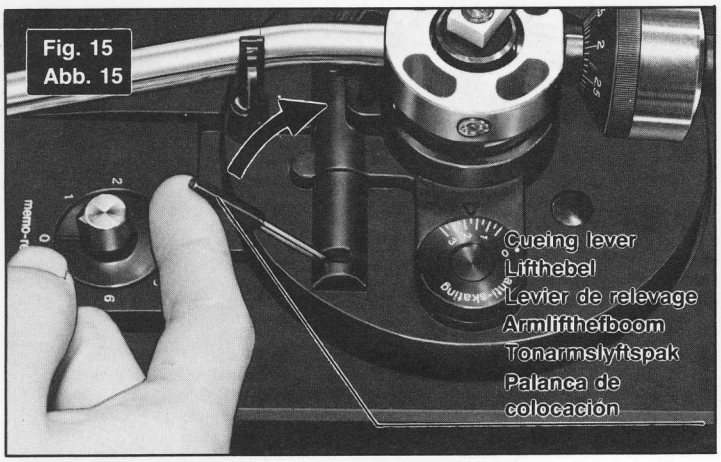
To remove stubborn finger prints or grease spots, detach the dust cover or disconnect the AC power plug and use a soft cloth damped with a mild soap and water solution.

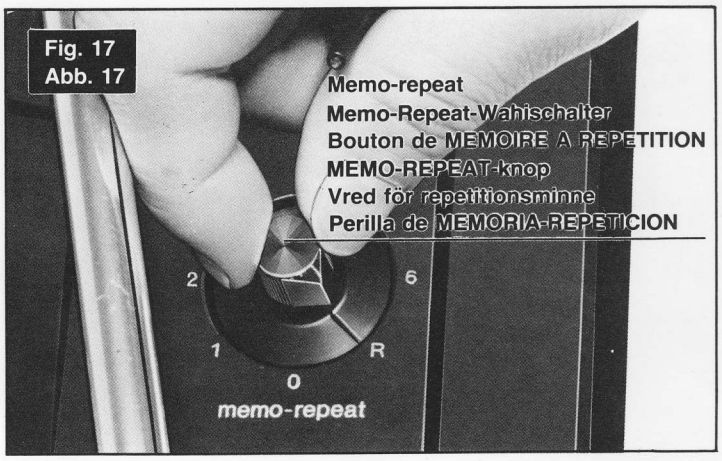
❸Dust and dirt adhering to the stylus tip or the record should be carefully removed.

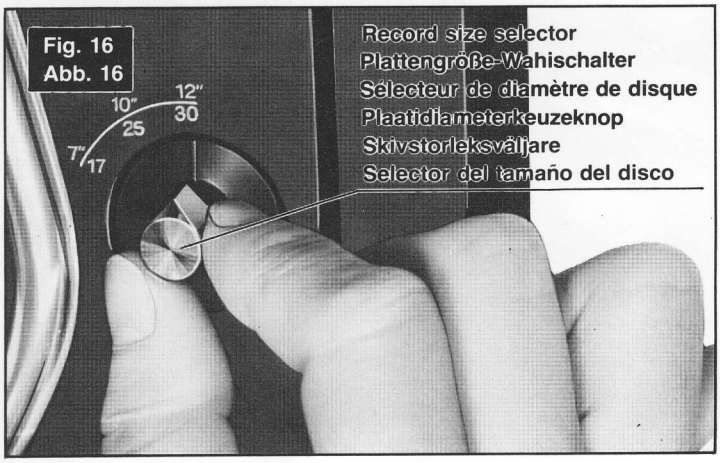
If used with dust and dirt adhering to the stylus tip, the stylus will not fit into the sound groove of the record correctly. This may not only result in the deterioration of tone quality, but cause undue wear of the record and the stylus tip itself.

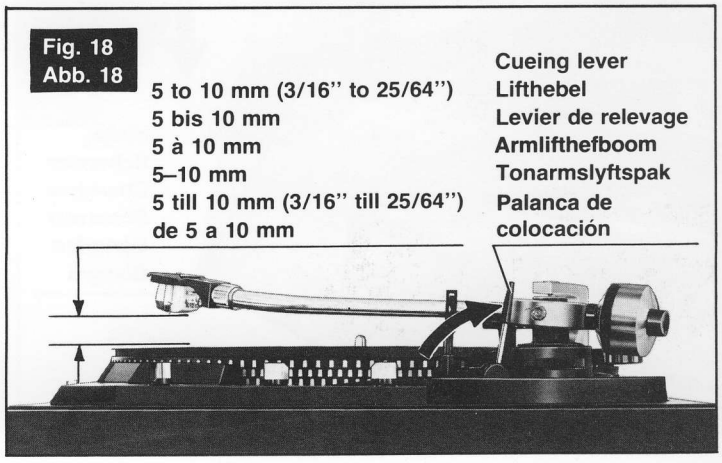
Use a brush having soft tips, moving it from the base to the tip of the stylus carefully for removing dust and dirt.

The record should also be carefully wiped with a record cleaner of high quality.









❹Before detaching or attaching the head shell, be sure to turn the volume control for the amplifier or receiver to "0" position, or to turn off the power.
Detaching or attaching of the head shell. with the volume control turned high, may not only result in unpleasant noises, but cause damage to the speakers.

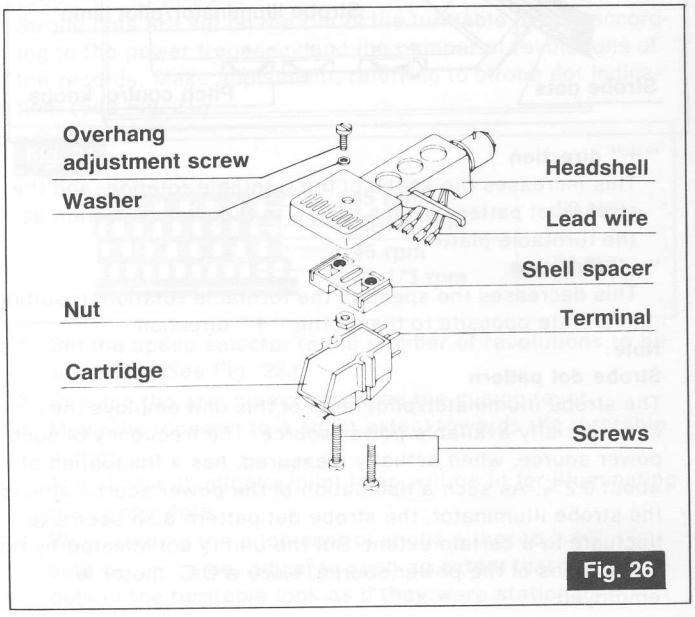
❺Wipe the head shell terminals from time to time. (See Fig. 23.)
Adhesion of dust and dirt to the head shell terminals may give rise to contact faults, thus resulting in increased "hum" noise or non-transfer of sound to the speakers. Use a soft dry cloth or the like for wiping the head shell terminals.

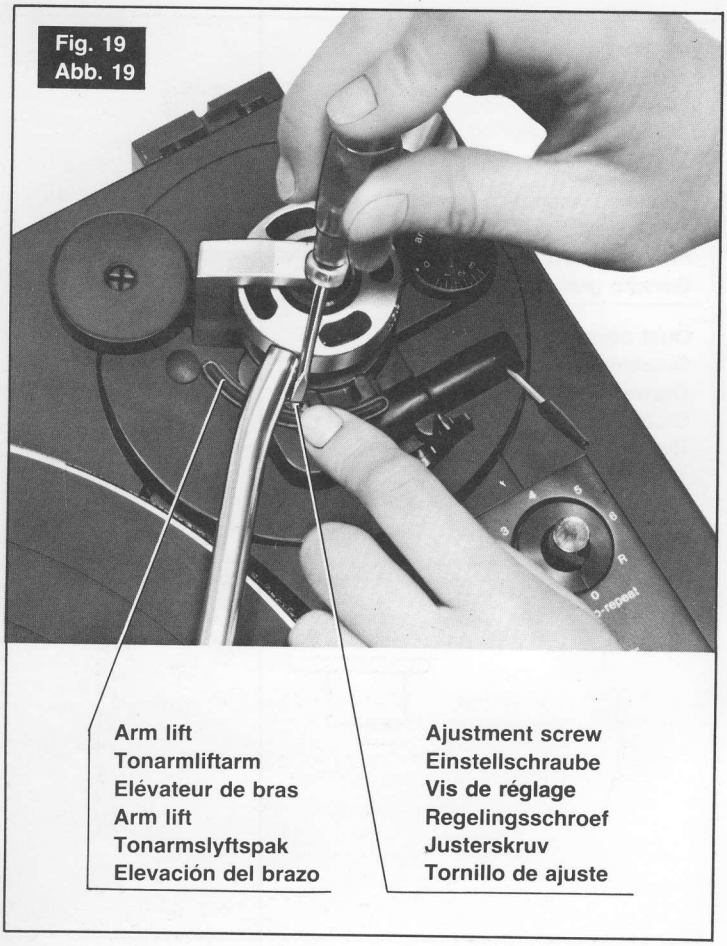
❻When you use other head shells, be careful about the head shell configuration. (See Fig. 24.)
When other types of head shells are employed the handle portion of the head shell may strike against the inner upper surface of the dust cover during the automatic start or automatic return movements of the tonearm. In such a case, we recommend to play with the dust cover open.

❼Replacement of the stylus (See Fig. 25.)
Remove the head shell/cartridge from the tubular arm. Hold the stylus assembly between fingers and withdraw it slantwise as shown in Fig. 25. Align the new stylus assembly with the square opening of the cartridge main body and push it into the opening positively as far as it will go. The unit is furnished with a diamond stylus. The life of the stylus differs depending on the conditions for use, but it is recommended to replace the stylus at the first sign of wear, regarding about 500 hours' use as an approximate standard.
The replacement stylus for the unit is the EPS-270ED.

❽Replacement of the cartridge. (See Figs. 26 and 27.)
1. Connect the lead wires to the cartridge terminals.
White (L +).....Left channel +
Blue (L −) .....Left channel −
Red (R +) .....Right channel +
Green (R −) .....Right channel −

2. Install the cartridge to the spacer, and tighten it with screws provided with the cartridge. (See Fig. 26.)





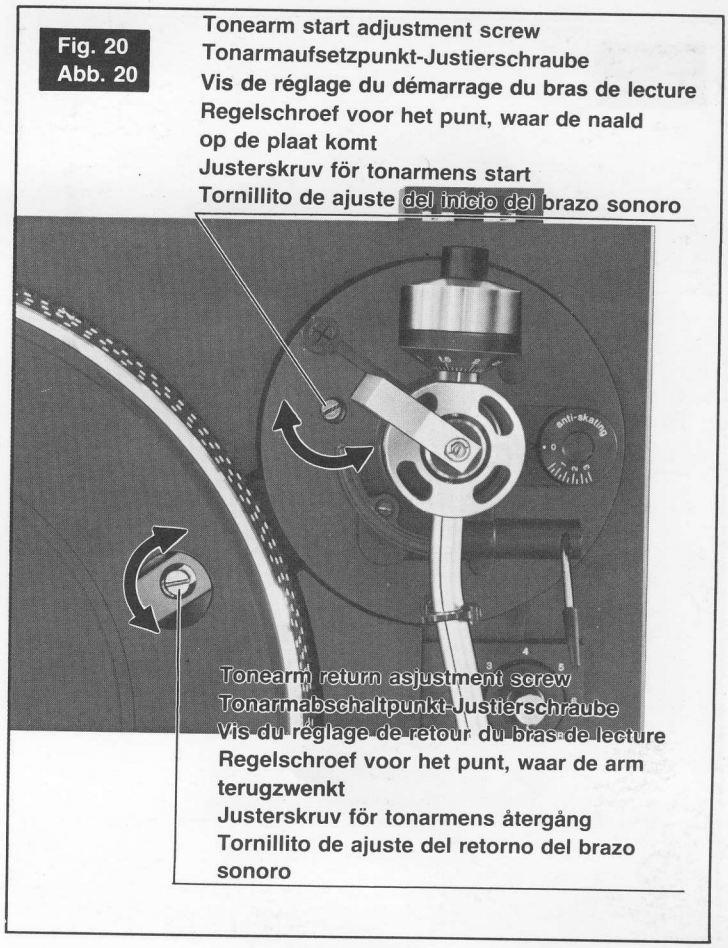
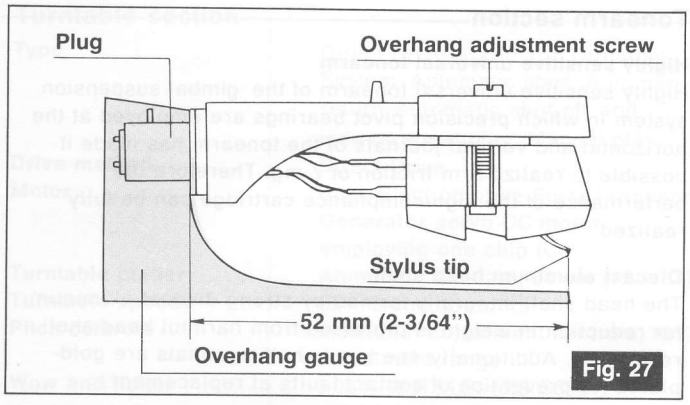


Fig. 20
Abb. 20
Tonearm start adjustment screw
Tonarmaufsetzpunkt-Justierschraube
Vis de réglage du démarrage du bras de lecture
Regelschroef voor het punt, waar de naald op de plaat komt
Justerskruv för tonarmens start
Tornillito de ajuste del inicio del brazo sonoro
Tonearm return asjustment screw
Tonarmabschaltpunkt-Justierschraube
Vis du réglage de retour du bras de lecture
Regelschroef voor het punt, waar de arm terugzwenkt
Justerskruv för tonarmens återgång
Tornillito de ajuste del retorno del brazo sonoro



3. Loosen overhang adjustment screw and move the cartridge forward or backward until the distance between the stylus tip and the plug becomes 52 mm (2-3/64") as shown in Fig. 27.
4. Tighten adjustment screw without moving the cartridge:

Features

Turntable section

■Automatic turntable system with "memo-repeat" which enables you to enjoy repeated play from 1 to 6 times and continuously repeated play.

The unit is equipped with "memo-repeat" mechanism peculiar to Technics which enables you to enjoy repeated play in addition to the manual play, auto-start, auto-return und auto-stop. Additionally, in the auto-function, excellent mechanism, designing and craftmanship such as out-sert molding, etc. are concentrated and in cooperation with a great deal of know-how obtained through actual production of auto-mechanism during the past many years, the quiet and highly reliable turntable system has been presented.

■High mass heavy weight class design placing particuiar emphasis on acoustic quality.

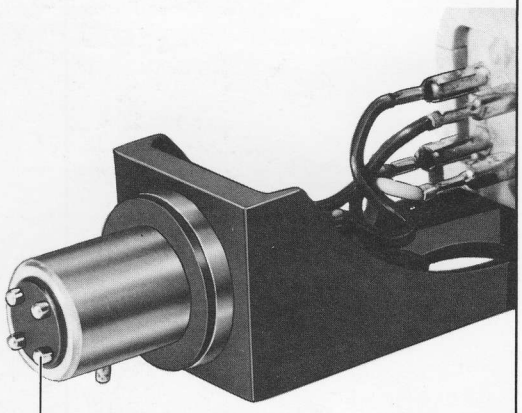
There are unexpectedly frequent demands for a compact and high performance turntable. In this unit, unnecessary space has been minimized as far as possible, while the heavy weight base produced through proper polymerization reaction of inorganic matter, resin and glass fibers is employed for the unit base which acts effectively for the prevention against external vibrations. Moreover, by the employment of the isolator in which visco-elastic material superior in external vibration cur-off and absorbing properties is combined with metallic spring, a marked improvement has been achieved in the howling prévention effect.

■ Motor construction peculiar to Technics in which the rotor of the motor is integrally connected to the turntable platter.

In Technics turntable systems we took the lead in the world by putting the Direct Drive system on the market with a marked improvement in the performance of turntables. Since then, we have developed numerous turntables of high performance, furnishing new topics of conversation each time.

One of these achievements is the motor construction of this unit, unique and singular in the world, in which the rotor of the motor is directly connected to the turntable platter.

Fig. 23
Abb. 23

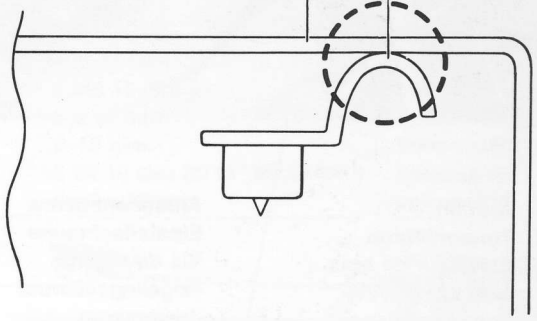


Head shell terminal
Tonarmkopfanschluß
Born de ia conque porte-cellule
Aansluiting van de elementhouder
Pickup-husets kontakt
Terminal de la càpsula

Fig. 24
Abb. 24

Large finger lift
Großer Griff
Souleveur manuel à grand dégagement
Groot uitsteeksel
Stor fingerlyft
Gancho grande para el dedo

Dust cover
Staubabdeckung
Couvercle anti-poussières
Stofkap
Plexiglashuv
Tapa de protección contra el polvo



■ **Automatic turntable system equipped with "memo-repeat" function capable of repeatedly playing a record from one to six times or continuously playing a record repeatedly.**

The unit is equipped with a convenient "memo-repeat" function, and you can enjoy manual playing; automatic start, automatic return, automatic stop, and in addition, repeatedly playing a record from one to six times or continuously playing a record repeatedly.

■ **Dependable one chip IC** (See Fig. 28.)

First in development of the IC (AN630) of the Back Electromotive Force Frequency Generator system.

The motor drive unit, control unit and various additional functions are integrated into the B.FG* system which utilizes the Back Electromotive Force Frequency generated in the drive winding of the Direct Drive Motor.

Consequently, superior temperature, drift and transient characteristics are obtained improving the overall reliability of the turntable system.

The one chip IC (AN630) employed in this unit has a total of 321 elements such as transistors, diodes, resistors and capacitors consolidated in a silicon substrate approximately 3×2.7 mm^2 in size. We take pride in the fact that the one chip IC (AN630) represents the world's largest degree of integration as a bipolar linear IC.

* Back Electromotive Force Frequency Generator

■ **Hi-fidelity performance with rumble (signal to noise ratio) of −73 dB (DIN45539B), wow and flutter of 0.03% (W.R.M.S.).**

The ultra-low speed brushless DC motor employed in this unit has the extremely low power consumption, and is thus free from vibrations due to excessive energy or heat generation. The high performance of the Direct motor is due to the efficiency of the newly developed heavy weight base and to the utilization of the one chip IC of the B.FG system.

Tonearm section

■ **Highly sensitive universal tonearm**

Highly sensitive universal tonearm of the gimbal suspension system in which precision pivot bearings are employed at the horizontal and vertical journals of the tonearm has made it possible to realize arm friction of 7 mg. Therefore the performance of the high-compliance cartridge can be fully realized.

■ **Diecast aluminum head shell**

The head shell integrally formed by strong diecast aluminum for reduction in weight is protected from harmful head shell resonance. Additionally, the head shell terminals are gold-plated for prevention of contact faults at replacement.

■ **Viscous damped cueing**

To prevent damage to the stylus tip and records liable to take place during operation of the tonearm, a cueing device damped with viscous oil is adopted.

Since the tonearm can be raised or lowered through operation of the lever, location of a desired playing portion or temporary suspension of the playing are conveniently achieved.

■ **Anti-skating control**

Proper outside force can be applied by such a simple operation as aligning the knob with the same value as the stylus pressure thus cancelling the skating force harmful to the stylus tip.

■ **Low-capacitance phono cables that will not impair the high-frequency characteristics of the cartridge**

Fig. 25
Abb. 25

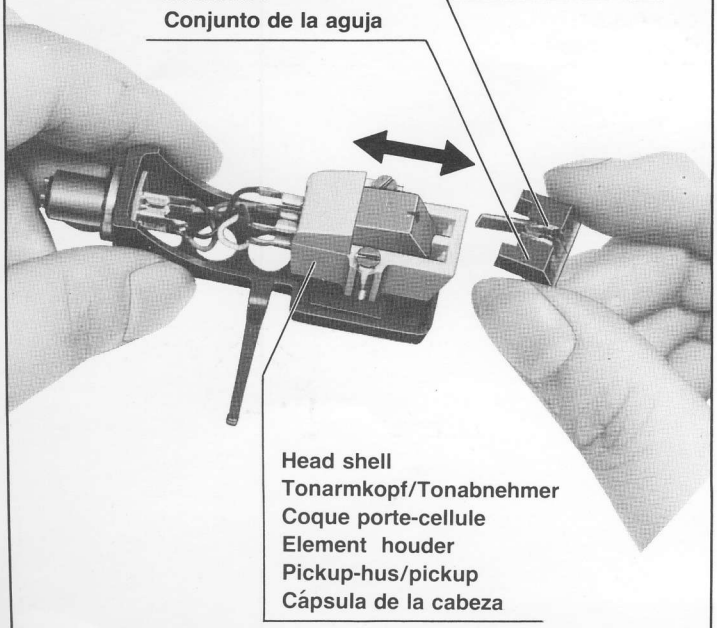
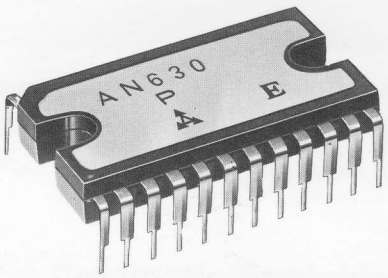
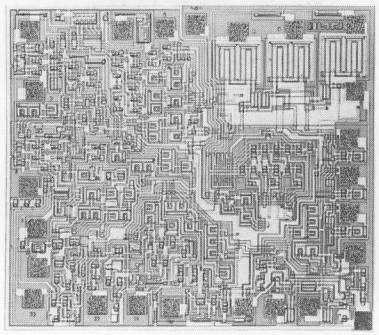


Fig. 28
Abb. 28



One chip IC (AN 630)



Interior of AN 630

Specifications

Turntable section

Type	Direct Drive Automatic Turntable System, Automatic start, Automatic return, Automatic shut-off and memo-repeat play, Manual play
Drive method	Direct Drive
Motor	Back Electromotive Force Frequency Generator servo DC motor employing one chip IC
Turntable platter	Aluminum die-cast, 31 cm (12-1/8")
Turntable speeds	33-1/3 and 45 r.p.m.
Pitch controls	Individual adjustment controls, 10% adjustment range
Wow and flutter	0.03% W.R.M.S. (JIS C5521) ±0.042% Weighted zero to peak (DIN 45507)
Rumble	−73 dB (DIN 45539B) −50 dB (DIN 45539A)

Tonearm section

Type	Universal tubular arm, static-balanced type
Effective length	230 mm (9-1/16")
Overhang	15 mm (19/32")
Friction	Within 7 mg (horizontally and vertically)
Tracking error angle	Within +3° { at the point of 145 mm (5-45/64") from the center }
	Within +1° { at the point of 55 mm (2-3/16") from the center }
Offset angle	21.5°
Adjustable stylus pressure range	0 to 3 g (stylus pressure direct reading type)
Cartridge weight range	5.5 to 9.5 g
Head shell weight	9.5 g

Cartridge section

Type	Moving magnetic stereo cartridge
Frequency response	20 to 25,000 Hz
Output voltage	3.2 mV (1 kHz, 5 cm/s. zero to peak lateral velocity) (4.5 mV 1 kHz, 5 cm/s. zero to peak 45° velocity)
Channel separation	25 dB at 1 kHz
Channel balance	Within 2 dB at 1 kHz
Load impedance	47 kΩ to 100 kΩ
Stylus pressure	1.75 ±0.25 g
Replacement stylus	EPS-270ED

General

Power supply	~110—120/220—240V, 50 or 60 Hz
Power consumption	4.5 W
Dimensions (H × W × D)	13.7 × 43.0 × 33.4 cm (5-3/8 × 16-15/16 × 13-1/8")
Weight	7.2 kg (15.9 lbs.)

Matsushita Electric Trading Co., Ltd.
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